WHAT IS CLAIMED IS:

1. A depolarized laser diode module comprising:

a laser diode module having one laser diode and one polarization maintaining fiber which is connected to an output side of the laser diode and;

a depolarizer connected to said laser diode module,

wherein a length L_{Pig} of the polarization maintaining fiber is a value obtained by calculation of equation 1 with use of a longitudinal mode spacing $\Delta\lambda$ of output light from the laser diode, an oscillating center wavelength λ_0 of the laser light, a beat length $L_{Beat\,1}$ of the polarization maintaining fiber and an optical wavelength λ_{Beat} used in a measurement of the beat length $L_{Beat\,1}$.

(Equation 1)

$$L_{Pig} < \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

2. The depolarized laser diode module of claim 1, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2.

(Equation 2)

$$L_{Pig} \fallingdotseq \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

3. The depolarized laser diode module of claim 1, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3.

(Equation 3)

$$L_{Pig} \fallingdotseq \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

4. The depolarized laser diode module of claim 2, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2'.

(Equation 2')

$$L_{Pig} = \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

5. The depolarized laser diode module of claim 3, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3'.

(Equation 3')

$$L_{Pig} = \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

6. The depolarized laser diode module of claim 1, wherein the length L_{Pig} of the polarization maintaining fiber is equal to or larger than a length in which there is no variation of an extinction ratio.

7. A depolarized laser diode module comprising:

a laser diode module having one laser diode and one polarization maintaining fiber which is connected to an output side of the laser diode and;

a depolarizer connected to said laser diode module,

wherein a length L_{Depo} of the depolarizer is a value obtained by calculation of equation 4 with use of a longitudinal mode spacing $\Delta\lambda$ of output light from the laser diode, an oscillating center wavelength λ_0 of the

laser light, a beat length $L_{Beat\,2}$ of a birefringent material used in said depolarizer and an optical wavelength $\lambda_{Beat\,2}$ used in a measurement of the beat length $L_{Beat\,2}$.

(Equation 4)

$$L_{Depo} < \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\,2}}{\lambda_{Beat\,2}}$$

8. The depolarized laser diode module of claim 7, wherein the length L_{Depo} of the depolarizer is expressed by equation 5.

(Equation 5)

$$L_{Depo} \fallingdotseq \frac{1}{2} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\,2}}{\lambda_{Beat\,2}}$$

9. The depolarized laser diode module of claim 8, wherein the length L_{Depo} of the depolarizer is expressed by equation 5'.

(Equation 5')

$$L_{Depo} = \frac{1}{2} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\,2}}{\lambda_{Beat\,2}}$$

10. The depolarized laser diode module of claim 9, wherein a length L_{Pig} of the polarization maintaining fiber is a value obtained by calculation of equation 1 with use of a longitudinal mode spacing $\Delta\lambda$ of output light from the laser diode, an oscillating center wavelength λ_0 of the laser light, a beat length $L_{Beat\,1}$ of the polarization maintaining fiber and an optical wavelength λ_{Beat} used in a measurement of beat length $L_{Beat\,1}$.

(Equation 1)

$$L_{Pig} < \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\,1}}{\lambda_{Beat\,1}}$$

11. An optical amplifier which uses a depolarized laser diode module as claimed in claim 10 as a pump light source.

12. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 10 as a pump light source.

13. The depolarized laser diode module of claim 10, wherein a Fiber Bragg Grating is formed in the polarization maintaining fiber.

14. The depolarized laser diode module of claim 10, wherein a polarization maintaining fiber is used as the depolarizer.

15. The depolarized laser diode module of claim 14, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

16. The depolarized laser diode module of claim 10, wherein a birefringent crystal is used as the depolarizer.

17. The depolarized laser diode module of claim 16, wherein a polarization direction of laser light inputted to the birefringent crystal is adjusted by inserting a $\lambda/2$ wavelength plate at an input side of the birefringent crystal.

18. The depolarized laser diode module of claim 16, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

19. The depolarized laser diode module of claim 10, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2.

(Equation 2)

$$L_{Pig} \fallingdotseq \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

20. The depolarized laser diode module of claim 19, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2'.

(Equation 2')

$$L_{Pig} = \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

21. An optical amplifier which uses a depolarized laser diode module as claimed in claim 20 as a pump light source.

22. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 20 as a pump light source.

23. The depolarized laser diode module of claim 10, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3.

(Equation 3)

$$L_{Pig} \fallingdotseq \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

24. The depolarized laser diode module of claim 23, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3'.

(Equation 3')

$$L_{Pig} = \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

25. An optical amplifier which uses a depolarized laser diode module as claimed in claim 24 as a pump light source.

26. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 24 as a pump light source.

27. The depolarized laser diode module of claim 9, wherein the length L_{Pig} of the polarization maintaining fiber is equal to or larger than a length in which there is no variation of an extinction ratio.

28. An optical amplifier which uses a depolarized laser diode module as claimed in claim 27 as a pump light source.

29. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 27 as a pump light source.

30. The depolarized laser diode module of claim 9, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 7.

(Equation 7)

$$L_{Pig} \leq \frac{3}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

31. The depolarized laser diode module wherein used as the depolarizer is a Lyot type consists of spliced two birefringent mediums with a length of L_{Depo} as claimed in claim 9 and 2 x L_{Depo} respectively in such a way that an angle of optical principal axes of the birefringent mediums is set at 45°.

32. The depolarized laser diode module of claim 31, wherein: said birefringent mediums are polarization maintaining fibers.

33. The depolarized laser diode module of claim 31, wherein: said birefringent mediums are birefringent crystals.

34. The depolarized laser diode module of claim 7, wherein the length L_{Depo} of the depolarizer is calculated by equation 6 with use of a spectrum FWHM (full width half maximum) $\delta\lambda_{FWHM}$ of said laser diode module and a target DOP value.

(Equation 6)

$$L_{Depo} \geq \frac{1}{\pi} \times \frac{\left(\lambda_0 - \frac{1}{2}\delta\lambda_{FWHM}\right)\left(\lambda_0 + \frac{1}{2}\delta\lambda_{FWHM}\right)}{\delta\lambda_{FWHM}} \times \frac{L_{Beat\,2}}{\lambda_{Beat\,2}} \times Log_e\left(\frac{DOP}{100}\right)$$

35. The depolarized laser diode module of claim 34, wherein a length L_{Pig} of the polarization maintaining fiber is a value obtained by calculation of equation 1 with use of a longitudinal mode spacing $\Delta\lambda$ of output light from the laser diode, an oscillating center wavelength λ_0 of the laser light, a beat length $L_{Beat\,1}$ of the polarization maintaining fiber and an optical wavelength λ_{Beat} used in a measurement of the beat length $L_{Beat\,1}$.

(Equation 1)

$$L_{Pig} < \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

36. An optical amplifier which uses a depolarized laser diode module as claimed in claim 35 as a pump light source.

37. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 35 as a pump light source.

38. The depolarized laser diode module of claim 35, wherein a Fiber Bragg Grating is formed in the polarization maintaining fiber.

39. The depolarized laser diode module of claim 35, wherein a polarization maintaining fiber is used as the depolarizer.

40. The depolarized laser diode module of claim 39, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

41. The depolarized laser diode module of claim 35, wherein a birefringent crystal is used as the depolarizer.

42. The depolarized laser diode module of claim 41, wherein a polarization direction of laser light inputted to the birefringent crystal is adjusted by inserting a λ/2 wavelength plate at an input side of the birefringent crystal.

43. The depolarized laser diode module of claim 41, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

44. The depolarized laser diode module of claim 35, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2.

(Equation 2)

$$L_{Pig} \fallingdotseq \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

45. The depolarized laser diode module of claim 44, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2'.

(Equation 2')

$$L_{Pig} = \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

46. An optical amplifier which uses a depolarized laser diode module as claimed in claim 45 as a pump light source.

47. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 45 as a pump light source.

48. The depolarized laser diode module of claim 35, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3.

(Equation 3)

$$L_{Pig} \fallingdotseq \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

49. The depolarized laser diode module of claim 48, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3'.

(Equation 3')

$$L_{Pig} = \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

50. An optical amplifier which uses a depolarized laser diode module as claimed in claim 49 as a pump light source.

51. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 49 as a pump light source.

52. The depolarized laser diode module of claim 34, wherein the length L_{Pig} of the polarization maintaining fiber is equal to or larger than a length in which there is no variation of an extinction ratio.

53. An optical amplifier which uses a depolarized laser diode module as claimed in claim 52 as a pump light source.

54. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 52 as a pump light source.

55. The depolarized laser diode module of claim 34, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 7.

(Equation 7)

$$L_{Pig} \leq \frac{3}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

56. The depolarized laser diode module of claim 55, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 8.

(Equation 8)

$$L_{Pig} \fallingdotseq \frac{1}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

57. The depolarized laser diode module of claim 56, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 8'.

(Equation 8')

$$L_{Pig} = \frac{1}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

58. The depolarized laser diode module wherein used as the depolarizer is a Lyot type consists of spliced two birefringent mediums with a length of L_{Depo} as claimed in claim 34 and 2 x L_{Depo} respectively in such a way that an angle of optical principal axes of the birefringent mediums is set at 45°.

59. The depolarized laser diode module of claim 58, wherein: said birefringent mediums are polarization maintaining fibers.

60. The depolarized laser diode module of claim 58, wherein: said birefringent mediums are birefringent crystals.

61. The depolarized laser diode module of claim 7, wherein a length L_{Pig} of the polarization maintaining fiber is a value obtained by calculation of equation 1 with use of a longitudinal mode spacing $\Delta\lambda$ of output light from the laser diode, an oscillating center wavelength λ_0 of the laser light, a beat length L_{Beat1} of the polarization maintaining fiber and an optical wavelength λ_{Beat} used in an measurement of the beat length L_{Beat1}.

(Equation 1)

$$L_{Pig} < \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

62. An optical amplifier which uses a depolarized laser diode module as claimed in claim 61 as a pump light source.

63. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 61 as a pump light source.

64. The depolarized laser diode module of claim 61, wherein a Fiber Bragg Grating is formed in the polarization maintaining fiber.

65. The depolarized laser diode module of claim 61, wherein a polarization maintaining fiber is used as the depolarizer.

66. The depolarized laser diode module of claim 65, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

67. The depolarized laser diode module of claim 61, wherein a birefringent crystal is used as the depolarizer.

68. The depolarized laser diode module of claim 67, wherein a polarization direction of laser light inputted to the birefringent crystal is

adjusted by inserting a λ/2 wavelength plate at an input side of the birefringent crystal.

69. The depolarized laser diode module of claim 67, wherein an extinction ratio of laser light output from the polarization maintaining fiber of said laser diode module is equal to or more than 15dB.

70. The depolarized laser diode module of claim 61, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2.

(Equation 2)

$$L_{Pig} \fallingdotseq \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

71. The depolarized laser diode module of claim 70, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 2'.

(Equation 2')

$$L_{Pig} = \frac{1}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

72. An optical amplifier which uses a depolarized laser diode module as claimed in claim 71 as a pump light source.

73. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 71 as a pump light source.

74. The depolarized laser diode module of claim 61, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3.

(Equation 3)

$$L_{Pig} \fallingdotseq \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

75. The depolarized laser diode module of claim 74, wherein the length L_{Pig} of the polarization maintaining fiber is expressed by equation 3'.

(Equation 3')

$$L_{Pig} = \frac{3}{4} \times \frac{\lambda_0^2}{\Delta\lambda} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}}$$

76. An optical amplifier which uses a depolarized laser diode module as claimed in claim 71 as a pump light source.

77. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 75 as a pump light source.

78. The depolarized laser diode module of claim 7, wherein the length L_{Pig} of the polarization maintaining fiber is equal to or larger than a length in which there is no variation of an extinction ratio.

79. An optical amplifier which uses a depolarized laser diode module as claimed in claim 78 as a pump light source.

80. A Raman amplifier which uses a depolarized laser diode module as claimed in claim 78 as a pump light source.

81. The depolarized laser diode module of claim 7, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 7.

(Equation 7)

$$L_{Pig} \leq \frac{3}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

82. The depolarized laser diode module of claim 81, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 8.

(Equation 8)

$$L_{Pig} \doteqdot \frac{1}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

83. The depolarized laser diode module of claim 82, wherein a length L_{Pig} of the polarization maintaining fiber is expressed by equation 8'.

(Equation 8')

$$L_{Pig} = \frac{1}{2} \times L_{Depo} \times \frac{L_{Beat\ 1}}{\lambda_{Beat\ 1}} \times \frac{\lambda_{Beat\ 2}}{L_{Beat\ 2}}$$

84. The depolarized laser diode module wherein used as the depolarizer is a Lyot type consists of spliced two birefringent mediums with a length of L_{Depo} as claimed in claim 7 and 2 x L_{Depo} respectively in such a way that an angle of optical principal axes of the birefringent mediums is set at 45°.

85. The depolarized laser diode module of claim 84, wherein: said birefringent mediums are polarization maintaining fibers.

86. The depolarized laser diode module of claim 84, wherein: said birefringent mediums are birefringent crystals.